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THE BULLETIN of GASTROINTESTINAL ENDOSCOPY

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The President's Page

The other day during a post-rounds discussion, four residents on the Gastroenterology Service were asked, for fun—out of meanness, they thought—to write down as many references to the carcinoid syndrome as they knew. There was an average of 2.5 quite accurate references per resident. Very good. Then they were asked to write down all the classical references to acute appendicitis they could think of. One of the four knew vaguely of one classical paper.

Then they were asked to write down the optical features of the Fiberscope and of the standard gastroscope. You know what happened. They wrote in detail about the two kinds of glass which make up a fiber of the Fiberscope, but they didn't know the angle of vision at the objective of the gastroscope they had been using right along. Two didn't know how much voltage we were using in the gastroscope, etc.

If I make too much of a point of this, I am only condemning myself, I know, but, speaking only of the endoscopic implications, it indicates that locally we had better learn and understand our current instruments before we start searching for new ones. There is danger at the moment of overlooking the advantages of what we have in the old-fashioned gastroscope because of the natural interest and excitement engendered by the fabulous potentials of fiberoptics.

There is more than just didactic focus involved here. Fiberoptics were introduced into peroral endoscopic experimentation for one reason: they permitted a remarkably flexible optical system without the limiting factor encountered in lens-optics, truncation of the field. They were seized on as a means of realizing an endoscopic dream, endoscopy of the small bowel. And they promise eventual realization of that dream. But, meanwhile, those who have taken up the technic with the currently available instrument are finding that it is not so easy to enter and to examine the duodenum. This is neither surprising, nor is it in any way discouraging for fiberoptics or for duodenoscopy. But it has led quite naturally to some disinterest in pursuing duodenoscopy further, with settling on the already-purchased duodenoscope as the routine instrument for ordinary gastroscopy.

This move must necessarily lead to disservice both to gastroscopy and duodenoscopy. Failure to realize that duodenoscopy, like any new technic, requires some working at can only lead to premature discouragement. Every new approach is necessarily introduced by enthusiasts—people who have already worked hard at it, have become proficient, and who, with a great deal of experience behind them, naturally speak as though the technic will be easy for everyone.

Just as important, misappropriation of the duodenoscope for routine gastroscopy can only lead to poorer gastroscopic examinations, unless this technic is pursued hard and for a long time. The appearances of the stomach are very different with the duodenoscope than they are with the standard gastroscope. Gastric anatomy and pathology must be learned all over again. In addition, the latter instrument has been subject to years of improvements to make it as ideal as possible for stomach examination. The duodenoscope has not and can by no means as yet compete for gastric work.

EDDY D. PALMER,
Colonel M. C.

from the Secretary's Desk

The spring meeting of the Society will be held on Wednesday, April 25, 1962, at the Roosevelt Hotel, New York City. The meeting this year will be one-half day only. A decision to have the meeting in the afternoon only was made to coincide with a full week of meetings in New York at that time. The Pan American Congress of Gastroenterology is meeting Monday through Wednesday morning. There is to be a luncheon following the Pan American Congress on Wednesday. Our meeting will follow the luncheon and there will be the usual cocktail party and banquet Wednesday evening. It is hoped that we shall have a good attendance from our own membership at the meeting and banquet. We know that there will be many of the Pan American group who will wish to attend our meetings. Arrangements have been made for simultaneous translation of the papers given at our meeting for the benefit of those from foreign countries who will attend. The program for the New York meeting will be made up before the time of the next publication of the Bulletin.

The response to the letter sent by the Secretary, asking for papers and suggestions, has been excellent. However, there have been more suggestions of subjects than applications for presentations. We will be happy to receive any proposed title for presentation between now and the middle of January. Applicants for membership are invited to participate in the program.

The Admissions Committee, at the present time, is processing applications for new memberships for several qualified endoscopists. Anyone wishing information or application blanks for new members may obtain the same by writing to the Secretary for the instructions and applications. Doctor Robert Nelson of Houston, Texas, is Chairman of the Admissions Committee but all applications are initiated through the Secretary of the Society.

The officers of your Society are proud of the new format for the Bulletin. We are indeed grateful to Dr. Horace Marvin, who is contributing his time and efforts as editor to make the Bulletin a success. Members of the association can also contribute to the success of the Bulletin by submitting good material for publication. The Secretary will appreciate any suggestions that you may have for improvement of the Bulletin.

FRANK B. MCGLONE, M.D.,

Secretary-Treasurer.

THE COMPREHENSIVE DIAGNOSTIC APPROACH TO DIFFICULT ESOPHAGEAL-GASTRIC PROBLEMS*

Howard F. Raskin, M.D., Joseph B. Kirsner, M.D., and Walter L. Palmer, M.D.
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Introduction: Cancer of the esophagus and stomach has no respect for conformity. The purpose of this paper is to briefly present five instructive cases of neoplasm encountered recently at the University of Chicago, illustrating the necessity of utilizing all available diagnostic procedures, often repetitiously. The correct diagnosis was aided further by the factors of clinical experience, judgement and perhaps good fortune. This report re-emphasizes the deceptiveness of esophageal and gastric cancer. Diagnostic dilemmas are not usually solved by conventional approaches, as the following cases illustrate.

Case No. 1—Dysphagia, Esophageal lesion: F. J., No. 676535, a 48-year-old pharmacist, was first seen in June, 1960, 17 days after noticing that salads seemed to lodge in the mid-esophageal region. X-rays of the esophagus and upper digestive tract were reported elsewhere as normal. There had been no weight loss. The initial roentgen studies at the University of Chicago were reported "probably normal esophagus." The possibility of a small polypoid lesion was considered, but dismissed as an indentation at the level of the bronchus. Esophagoscopy four days later demonstrated inflammation of the mucosa at the level of 38 centimeters. The esophagoscope passed readily into the stomach without encountering any narrowing. Two biopsies revealed inflammation of glandular epithelium. Gastric analysis revealed a hyper-secretory pattern. On July 2, 1960, exfoliative cytologic studies of the esophagus demonstrated undifferentiated malignant cells. Two weeks later a second esophagoscopy indicated redness and friability of the mucosa from a level of 28 centimeters distally. Biopsies were obtained at 27, 33, 36, 40 and 43 centimeters. Only the biopsy at 27 centimeters contained esophageal mucosa, described as normal squamous epithelium. The other biopsies consisted of glandular epithelium of gastric origin; these were interpreted as demonstrating minimal gastritis. In view of the absence of carcinoma on seven esophageal biopsies, the patient was placed on an antacid regimen.

He returned in two weeks, reporting less dysphagia and a weight gain of several pounds. Nevertheless, a repeat esophageal cytologic lavage again revealed malignant cells. The patient was reluctant and the surgeons hesitant to operate in spite of the positive cytologic studies. However, another x-ray examination demonstrated rigidity of the posterior wall of the esophagus in its lower one-third, on the right, with a suggestion of an overhanging margin. The roentgenologist now favored the possibility of neoplasm rather than peptic esophagitis. On August 16, 1960, a partial esophagectomy with an esophago-gastric anastomosis was performed. Twelve centimeters of lower esophagus and cardia were resected. An ulcerating neoplasm, 3.5 centimeters long and 1.5 centimter wide with slightly elevated margins, was located in the upper portion of the resected specimen. The histological diagnosis was adenocarcinoma with invasion of the internal layer of the muscularis but no evidence of spread to any of 22 lymph nodes examined. The post-operative course was complicated by a wound infection. In the nine months since the operation the patient has returned to full employment, is asymptomatic, with no evidence of metastatic spread.

Comment: Multiple esophageal biopsies failed to penetrate sufficiently to expose the underlying adenocarcinoma of the esophagus. The normal esophagus ended at approximately 28 centimeters, measured from the incisor teeth. The increased incidence of carcinoma developing in the gastric epithelium of the congenitally short esophagus has been previously stressed[1]. Adenocarcinoma of the esophagus, not uncommonly, extends longitudinally at the submucosal level, with very little involvement of the mucosal surface. The neoplasm ulcerated during the month interval between the last esophagoscopic

*The cytologic studies were made possible by a field investigational grant from the National Cancer Institute, National Institutes of Health, U. S. Public Health Service and the Wallach Fund for Research in Gastrointestinal Disease.

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examination and surgery. The technique of exfoliative cytology was sufficiently sensitive to detect the tumor in its early stage, thus increasing the possibility of survival.

Case No. 2—Lesion on Greater Curvature of Stomach: S. A., No. 772834, a 57-year-old woman, was admitted to the hospital in January 1961, because of an ulcer, two centimeters in diameter, on the greater curvature of the stomach. Radiating folds blended into a zone of edema surrounding the ulcer margin. The ulcer was considered benign roentgenologically, although the possibility of carcinoma could not be excluded. The patient had experienced classic ulcer distress-type pain for eight years, but the pain had become more severe in the three weeks preceding hospitalization. There had been a weight loss of twelve pounds. The feces were positive for occult blood. Stimulation with histalog demonstrated substantial amounts of hydrochloric acid.

Gastroscopy revealed a 4 x 6 centimeter, somewhat pale, nodular, elevated mass on the greater curvature of the stomach, near the angulus. At 2 or 3 points, the mass appeared folded upon itself and the presence of white mucus raised the possibility of ulceration, although a crater was not visualized. The mass did not decrease with insufflation of air. The gastroscopic impression was that of a polypoid, infiltrating neoplasm of the mid-portion of the stomach on the greater curvature. Exfoliative cytologic studies were negative for malignant cells. On antacid therapy the patient became completely asymptomatic. Biopsy of the lesion was attempted with the Benedict operating gastroscope. On this occasion, the lesion did not appear to be as nodular as previously noted, but a small ulceration was observed which measured slightly larger than the diameter of the jaws of the biopsy instrument. The forceps were introduced into this opening and tissue was obtained from within the ulcer crater. A second biopsy was obtained from the edge of the small aperture, and two deeper biopsies were taken from the surface within 1 centimeter of the opening. Biopsies from only the base and the edge of the ulceration revealed infiltrating, poorly differentiated, mucus-secreting adenocarcinoma, with nests of tumor cells infiltrating the muscle. The other two biopsies contained normal mucous glands.

A subtotal gastrectomy was performed. The ulcer measured only 0.6 centimeter in diameter and 0.3 centimeter in depth. It appeared punched out and had a roughened surface. The entire ulcer had re-epithelized with a single layer of flat columnar epithelium. The base of the ulcer, histologically, was composed primarily of granulation tissue, but the lateral edges of the ulcer were heavily infiltrated with poorly differentiated adenocarcinoma. The carcinoma had extended through the muscularis into the adherent omental fat. Eighteen of forty-one lymph nodes contained metastatic tumor.

Comment: Interesting features of this ulcer were: (a) The nodular mass on the greater curvature, demonstrated by x-ray and gastroscopy, was not produced by tumor mass. It was the result of invagination of a segment of the greater curvature produced by extrinsic pressure from the attached omentum. (b) The negative cytologic examination is explained by the intact regenerative epithelium interposed between the tumor and the gastric lavage solution. (c) The Benedict operating gastroscope provided the only definitive approach, succeeding because the gastroscopist successfully introduced the forceps through the narrow mouth of the flask-shaped ulcer.

Case No. 3—Gastric Lesion in a Patient with Previous Gastric Carcinoma: M. P., No. 138048, a 42-year-old housewife, was admitted in August, 1956, because of nausea and vomiting. In 1944, at the age of 30, the patient had undergone a subtotal resection for an infiltrating ulcerating neoplasm of the gastric antrum. She had remained well until the present symptoms developed. X-rays in Hawaii were similar to those taken at the University of Chicago in demonstrating multiple polypoid masses, compatible with recurrent carcinoma, in the gastric stump.

Gastroscopic examination revealed an intact anastomosis surrounded by large pseudopolypoid folds which were pliable and reducible by insufflation of air. The gastroscope was passed several centimeters into normal small bowel. However, on the posterior wall of the stomach an elevated 1 centimeter nodule, covered by a grayish exudate, became visible. Exfoliative cytologic studies were negative for malignant cells. Several days later, the Benedict operating gastroscope was introduced and four biopsies were obtained from the nodular mass, which was covered by an intact mucosa. Three of

the gastroscopic biopsies were interpreted as benign glandular epithelium, while the fourth demonstrated adenocarcinoma. At surgery, the mucosa of the opened stomach was smooth, pliable and appeared normal. Consultation with the pathologist reaffirmed that one of the four biopsies indicated malignancy. The possibility of a "floater" inadvertently entering the specimen capsule in the microtome was excluded, as four biopsies were obtained and accountable. Therefore, the remaining stomach was resected except for a segment of cardia one inch wide.

The resected stomach was examined carefully for evidence of malignancy but none was found. However, there was a ready explanation for the "false-positive" biopsy. Isolated clusters of mucosal glands revealed marked basal proliferative hyperplasia and metaplasia. The "false-positive" biopsy was the smallest of the four obtained and, almost unbelievably, had sampled one of these focal reactive areas. The patient is well now, four and one-half years post-operatively.

Comment: The nausea and vomiting which led to a second hospitalization, have not been explained satisfactorily, unless on a functional basis. The nodules noted by the roentgen and gastroscopic examinations were obviously post-operative changes in a redundant pliable mucosa. Perhaps, x-rays should be obtained soon after gastric resection to provide evidence of surgically induced alterations in the gastric mucosa, as a basis for future comparison. This case illustrates the unusual circumstances of obtaining fragments of gastric mucosa originating in severely hyperplastic mucosa and simulating carcinoma. Nevertheless, the second gastric resection seemed justifiable because of the ominous histologic changes in isolated glands of the residual mucosa.

Case No. 4—Occult Gastric Malignancy Associated with Pernicious Anemia: E. H., No. 622893, a 55-year-old Negro construction worker with pernicious anemia was referred originally in 1955 by the hematology clinic of another hospital for a routine gastric cytologic examination. Although the patient had no symptoms, malignant cells in small numbers were found in the gastric wash. Gastroduodenal x-rays at both hospitals were considered normal. Gastroscopy revealed diffuse gastric atrophy of the type commonly seen in pernicious anemia. The patient refused surgery. Repeat gastroscopic examination nine months later revealed no changes, although exfoliative cytologic studies continued positive for malignant cells. Another gastroduodenal roentgen study in November 1956, was normal.

The patient was not seen for four years. In August, 1960, our colleagues in the referring hospital informed us that the patient had complaints suggestive of gastric obstruction and that x-rays and gastroscopic examination revealed a mass in the fundus of the stomach. Both examinations were repeated at the University of Chicago. At gastroscopy the entire posterior wall of the stomach was involved by a fungating mass, covered with yellow exudate and superficial ulcerations, and there was evidence of gastric retention. Another cytologic examination was made to compare morphologically, the original malignant cells obtained in 1955, with the "old" exfoliated cells of 1960. Although there was no question as to the continued presence of malignant cells on the last examination, the retained food distorted the cells sufficiently to invalidate the comparison. The patient finally submitted to surgery on May 4, 1961. A non-resectable carcinoma of the stomach was present with spread to the peritoneum and liver.

Comment: Gastric cancer associated with pernicious anemia may progress slowly. This patient obviously should have undergone surgery five years ago when the tumor most likely was a carcinoma in situ. The fact that several gastroscopic examinations failed to reveal the tumor suggests that the neoplasm may have originated in one of the so-called "blind-areas." A similar experience of a positive gastric cytologic examination with no other substantiating clinical evidence, and a follow-up period of five years before the clinically obvious presence of the tumor has recently been reported[2].

Case No. 5—Obscure Gastric Lymphosarcoma: A. K., No. 398871, a 49-year-old white female, was admitted in March, 1956, because of a single episode of hematemesis. The patient's difficulties dated to 1947 when she had her first bout of hematemesis. She was gastroscoped by one of us (JBK) at that time. Enlarged tortuous rugae with diffuse oozing of blood from the entire mucosal surface was noted. An infiltrating neoplasm was considered in the differential diagnosis, but the final impression was severe hypertrophic gastritis. The

patient responded to antacid therapy. In 1949, while in Canada, she experienced vague upper abdominal distress followed by tarry stools. She resumed a strict ulcer program, with sudsidence of distress and disappearance of the melena.

The patient made bi-annual or yearly visits to the University of Chicago for the next seven years, without evidence of further difficulty until January, 1956, when she noted dull aching pain in the upper left abdomen, relieved by milk. After several days, she vomited half a cup of semi-bright blood. Physical examination was non-revealing. Gastroduodenal x-ray examination was completely normal, as had been the case on six previous examinations. Gastric analysis revealed a maximum of 25 units of hydrochloric acid. Gross blood was present. Gastroscopic examination revealed a severe, superficial, hemorrhagic, erosive gastritis, involving the upper anterior wall, greater curvature and posterior wall of the stomach. There were numerous (approximately 30) tenacious, whitish plaques, elevated on pinkish to purplish erythematous bases. Intrigued by the bizarre gastroscopic appearance, the gastroscopist requested an exfoliative cytologic examination of the stomach which revealed the lymphoblast cell diagnostic of lymphosarcoma. Several "blind" biopsies were obtained with the Wood tube, leading to a diagnosis of chronic atrophic ulcerative gastritis. However, the pathologist, noting the profuse lymphoid cell hyperplasia, seriously considered a lymphosarcoma.

At operation, the stomach was grossly normal in its lower half. The serosa of the upper one-half was stippled with slightly elevated, flat, pinkish granulation-like tissue. There was no obvious tumor mass within the wall of the stomach and, upon opening the stomach, no tumor or gross ulcerations were seen. Numerous lymph nodes in the mesentery of the stomach measured as much as 1½ centimeters in diameter. Suitable biopsies were obtained of the stomach and lymph node, revealing lymphosarcoma. The patient received roentgen irradiation in the form of an upper abdominal bridge. She has been free of gastrointestinal complaints for the last five years. Recently, she has developed a macroglobulinemia which may indicate reactivity of the tumor.

Comment: A routine gastroscopic examination initiated exfoliative cytologic studies which provided the first indication of the existing tumor. A blind gastroscopic biopsy, although suspicious, was not sufficient for pathologic confirmation. The clinical course and strikingly similar gastroscopic examinations performed nine years apart indicate that the patient had primary lymphosarcoma of the stomach in 1947 with long periods of remission. Gastric resection was not performed because tumor was found in local lymph nodes and because of the anticipated difficulty in maintaining nutrition following total gastrectomy.

Conclusion: Five diagnostic problems of the esophagus and stomach are presented, each similar in that multiple approaches were required to establish the proper diagnosis. The limitations of technique and interpretation always must be appreciated and accounted for. Sometimes only one of several diagnostic attempts will be decisive. The combination of x-ray, gastroscopy, exfoliative cytology and gastric biopsy, fortified by clinical suspicion and by diagnostic persistence, should facilitate the recognition of even the more unusual and difficult diagnostic problems of the upper digestive tract.

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We are indebted to our cytologists, Miss Sylvia Pleticka, Research Assistant; Mrs. Penny Ford and Mr. Leroy A. Cockerham.

THE PROBLEM OF DIAGNOSIS OF ESOPHAGEAL VARICES*

A Radiologic and Endoscopic Study

Angelo E. Dagradi, M.D., Allan B. Skorneck, M.D., and Stephen J. Stempien, M.D.

The clinical diagnosis of esophageal varices depends upon their demonstration by the roentgenologic examination and by the peroral endoscopic techniques (esophagoscopy and gastroscopy). Each method has its own inherent limitations. This study was accomplished in an effort to elucidate the diagnostic problems which were encountered with each method in a group of 200 patients with proved liver cirrhosis and to compare their diagnostic accuracy. In all instances, an adequate barium esophagram and an esophagoscopic examination were done sufficiently close enough together to permit a fair comparison of the diagnostic results. In addition, a gastroscopic examination was performed in 46 patients (23%).

X-Ray Method

The esophagrams were reviewed by the participating Senior Radiologist and were categorized as being either negative, positive, or equivocal, for varices. In the positive cases, an effort was made to estimate their size and longitudinal extent.

In this study of 200 patients, varices were demonstrated radiologically in 78 (39%), the diagnosis was equivocal in 31 (15.5%), and negative findings occurred in 91 (45.5%). (Table I).

The radiologic diagnosis of esophageal varices depended upon the demonstration of certain abnormalities of the mucosal folds of the esophagus and/or the demonstration of polypoid filling defects in this organ. In the former, attention was centered on the finding of unusually widened or thickened folds in an optimally relaxed esophagus, irregularity of folds (sigmoid-shaped or serpiginous appearance), "beading," scalloping of folds, or of the margins of the esophagus, and "cross-hair" striations on enlarged folds. Multiple spot-filming in various stages of esophageal relaxation is essential, since, sometimes, in a series of as many as 8 to 12 film exposures, only one or possibly two of the films demonstrated varices.

The term "equivocal" was used when the diagnosis was uncertain and applied in the following instances:

1. When the degree of enlargement of the mucosal folds of the esophagus could be interpreted to represent normal variants.

2. In some cases of sliding esophageal hiatus hernia (a condition which is not too uncommonly encountered in patients with liver cirrhosis) in which the presence of gastric rugal folds above the diaphragmatic hiatus may exactly mimic the characteristic widening, thickening and tortuosity which may be attributed to varices of the lower segment of the esophagus.

3. Tertiary contraction waves, which may produce marginal irregularities of the esophagus that can be confused with the deformity produced by varices.

4. Air bubbles in the barium column, which may be confused with polypoid filling defects caused by varices.

The Endoscopic Method

Esophagoscopy: Varices were classified according to their caliber and their longitudinal extent, the latter being estimated in centimeters on a calibrated esophagoscope using the front teeth of the patient as point of reference. The following gradation was used:

Grade I: Small, superficial, tortuous, sigmoid-shaped, or even straight veins, measuring 2 mm or less in diameter, and best demonstrated by occluding their lumen with the tip of the esophagoscope as it is advanced or withdrawn along a segment of the esophageal wall. These veins are dusky-red, reddish-blue, or may only transmit the color of the over-lying esophageal mucosa. This is the earliest stage of phlebectasia that can be reliably characterized by the esophagoscopic technique.

Grade II: Dilated veins having a diameter of 2-4 mm which, in the relaxed esophagus and without compression with the tip of the instrument, are noted to be slightly elevated above the surface or to form irregular protrusions.

Grade I and II esophageal varices are not uncommonly seen in patients with sliding esophageal hiatus hernia who have neither liver cirrhosis nor portal hypertension.

Grade III: These measure in excess of 4

*From the Gastroenterology Section of the Medical Service and from the Department of Radiology, Veterans Administration Hospital, Long Beach, California. Presented at Annual Meeting, American Gastroscopic Society, Chicago, May 24, 1961.

mm in diameter, are slate-gray or dusky-red in color and protrude in the relaxed esophagus without compression by the tip of the instrument. They are discreet and tortuous, and are separated by a normal mucosal surface between them, uninvolved with varices. In this category, an anterior or "sentinel" vein is encountered with the greatest degree of frequency and constancy.

Grade IV: These are large varices and represent a maximal phase of development of this condition. They bulge into and fill the distal end of the esophagoscope as it is advanced, completely surround the interior of the esophagus, forming a conglomeration, with no uninvolved segment of esophagus between them. They often meet in the mid-line and have a "grape-like," purplish-red succulent appearance. Grade I and II varices are sometimes seen superimposed upon these large ones.

Problems in diagnosis arise in the following instances:

1. When large veins are limited to the distal segment of the esophagus and are covered with a mucosa of normal thickness, thus failing to transmit the characteristic blue-gray or purplish color but, instead, presenting as enlarged, "bulbous" folds. In such cases it may be difficult to differentiate them from the gastric rugal folds of a sliding esophageal hiatus hernia[1].

2. Conversely, when a hiatus hernia is present, the large gastric rugal folds may be mistaken for varices when, in actuality, these are not present at all.

3. When a sliding esophageal hiatus hernia is actually present and large varices occur in the hernial sac, not yet having extended prominently into the esophagus. In such cases, no diagnostic assistance accrues from the finding of varices of the 1+ to 2+ variety in the esophagus since these can occur in patients with sliding esophageal hiatus hernias who have neither liver cirrhosis nor portal hypertension. Our experience, in this respect, corresponds with that of Palmer[2]. Gastroscopy is frequently of diagnostic assistance in such cases by demonstrating gastric varices which can be traced proximally into the esophagus.

4. At times during the hypovolemia associated with hemorrhage, varices may be difficult to demonstrate, only to be readily apparent when the esophagoscopic examination is repeated following cessation of bleeding and restoration of blood volume.

5. Following successful venous shunting operations persistent, but collapsed varices, may be difficult to demonstrate although they were 3+ to 4+ in size prior to surgery. Having the patient perform the valsalva maneuver during the esophagoscopic examination will help to demonstrate these varices.

6. In some patients having a short, thick neck and narrow mouth aperture, and those who are unable to adequately extend their heads because of disease processes involving the cervical spine, it is often impossible to visualize the distal segment of the esophagus with the esophagoscope. Varices may, therefore, be present and yet not be detected. In such cases, gastroscopy may be of great diagnostic assistance. Such limitations may also be encountered in patients having deformities of the thoracic spine, aortic dilatations or aneurysms.

In our evaluation of 200 patients with liver cirrhosis by esophagoscopy we found large varices to be present in 118 patients (59%) and smaller varices in 46 (23%) for a total of 164 cases or a diagnostic yield of 82%. The esophagoscopic diagnosis was equivocal in five cases (2.5%) and no varices were detected in 31 (15.5%). (Table II).

Gastroscopy: The use of gastroscopy[3] for the diagnosis of varices has been of value when the esophagoscopic examination presented equivocal findings and in those instances where, because of anatomical factors it was impossible to visualize the lower segment of the esophagus with the esophagoscope.

Five cases were encountered in the present series in which the esophagoscopic examination resulted in equivocal findings. In one of these patients, enlarged, bulbous folds were noted in the lower segment of the esophagus which were not sufficiently characteristic to permit a definite diagnosis of esophageal varices (a diagnosis of "probable underlying varices" was made). Gastroscopic examination confirmed the presence of varices in the gastro-esophageal vestibule in this case and a hiatus hernia was not seen. In two other cases it was impossible to make the distinction esophagoscopically between large varices in the lower esophagus and large gastric rugal folds produced by a sliding esophageal hiatus hernia.

In both cases the gastroscopic method permitted the diagnosis of a sliding esophageal hiatus hernia to be made. Varices were seen within the hernial sac in one;

and were noted to involve the gastroesophageal vestibule and the lower esophagus in the other. One of these patients later developed a fatal variceal hemorrhage. Anatomic abnormalities prevented esophagoscopic inspection of the lower segment of the esophagus in two patients in this series. In these patients, gastroscopy demonstrated varices in the gastro-esophageal vestibule and lower esophagus in one and in the gastro-esophageal vestibule alone in the other.

COMPARISON OF THE X-RAY AND ESOPHAGOSCOPIC RESULTS

Table III compares the relative value of x-ray and esophagoscopy in the establishment of a diagnosis of esophageal varices in this series of 200 patients with proved liver cirrhosis.

A radiologic diagnosis of esophageal varices was made in 78 patients. In this group, esophagoscopy demonstrated large varices in 69, small varices in 5, while no varices were seen in 4.

An analysis of the last group is of interest. In two of these patients in whom a diagnosis of varices involving the lower segment of the esophagus was made on x-ray, no varices were noted on esophagoscopy. Instead, a sliding esophageal hiatus hernia was seen in each case which was subsequently confirmed on repeat x-ray study. On reviewing the first set of films in the light of the radiographic findings of the second examination, it became apparent that the initial diagnosis of esophageal varices was erroneous and that the abnormality of the mucosal fold pattern above the diaphragm actually represented deformity due to a sliding esophageal hiatus hernia. In one patient having a positive x-ray diagnosis and negative esophagoscopic findings, gastroscopy demonstrated the presence of varices in the gastro-esophageal vestibule. In the fourth patient, the reason for the disparity between the x-ray and the endoscopic findings was not ascertained because of failure to obtain follow-up studies.

The x-ray diagnosis was equivocal in 31 instances. In this group, esophagoscopy demonstrated large varices in 22, small varices in 5, was equivocal in 2, and was negative in 2 cases. One of the patients in the last group entered the hospital because of upper gastro-intestinal hemorrhage, which was interpreted clinically to be due to bleeding esophageal varices. Esophagoscopy showed no varices, but gastroscopy demonstrated the presence of hemorrhagic gastritis involving the mucosa of a sliding esophageal hiatus hernia.

The radiologic method failed to demonstrate esophageal varices in 91 cases (45.5%). In this group, esophagoscopy demonstrated large varices in 27 and small varices in 36 (a total of 63). The esophagoscopic diagnosis was equivocal in 3 patients and confirmed the absence of esophageal varices in 25.

In summary, the esophagoscopic examination demonstrated the presence of esophageal varices in 164 (82%) of the 200 patients in this study, while the radiologic examination was positive in only 78 (39%). The small varices were missed with greater frequency by x-ray (78% of these were not seen) than were the large varices (23% not demonstrated).

In reviewing the x-ray films, an effort was made by the radiologist to estimate the longitudinal extent of the esophageal varices when these were seen. Almost without exception, the varices were noted on esophagoscopic examination to involve a greater longitudinal extent of the esophagus than was demonstrated radiologically.

Thus the endoscopic method is far superior to the conventional* radiologic method both for the detection of esophageal varices[4] and for the determination of their size and extent.

DISCUSSION

The radiologic portion of this study is based upon a **review** of the x-ray films by the participating senior radiologist. The films, when presented to him, were stripped of identification and were interspersed with sets of films of patients having neither liver cirrhosis nor esophageal varices (these were also endoscopically controlled). He also had available esophagrams from several separate examinations in each case. This tended to increase the accuracy of the x-ray method for, in a number of cases where esophageal varices had not been diagnosed by the

(Continued on Page 12)

*Cineradiographic examination of the esophagus, by permitting the taking of multiple films in rapid succession, holds promise for greatly increasing the accuracy of the x-ray diagnosis in patients having esophageal varices. In viewing the dynamic changes in the esophagus by this method, the recurrent appearance and disappearance of varices during the same examination is very striking and readily explains the necessity for proper timing of exposure of the x-ray film in order to demonstrate existing varices when using the conventional method.

radiologist who originally interpreted the films, such an error was avoided in the review because of the availability of more films. The opposite also held true in some cases, namely, that an originally-made positive report was interpreted to be negative on review. Interestingly enough, no false positive diagnoses were made by the radiologist in interpreting the control films.

The importance of repeated examinations and of checking one diagnostic method against the other in order to attain the greatest accuracy is obvious. This is especially true in doubtful cases and in those in which the findings disagree.

The diagnostic problem presented to both the radiologist and the endoscopist by the complicating presence of a sliding esophageal hiatus hernia has been noted. From the x-ray standpoint, this condition may lead to an erroneous diagnosis of esophageal varices because of the following reasons:

1. The presence of gastric rugal folds above the diaphragm may mimic varices of the lower portion of the esophagus.

2. A buckling of the lower segment of the esophagus in this condition may cause the folds to appear thickened and tortuous —again simulating varices—and may also impart a scalloped appearance to the border of the lower portion of the esophagus. In this series of 200 patients, a sliding esophageal hiatus hernia was demonstrated by x-ray and/or endoscopy in 46 (23%). Large varices were present in 18 of these patients, small varices in 19, no varices were seen in 7, while equivocal esophagoscopic findings occurred in 2. The diagnosis was established in the latter by gastroscopy.

There were 19 patients with liver cirrhosis in this study who demonstrated small esophageal varices and had a complicating esophageal hiatus sliding hernia. In this group it is impossible to state whether the varices were due to portal hypertension 2° to the liver cirrhosis; whether they were due to the hernia itself; or whether they were due to a combination of the two factors. In one patient having a sliding esophageal hiatus hernia, small esophageal varices, and varices in the gastric cardia, a percutaneous spleno-portogram was done which showed a conglomeration of short gastric collaterals and an intra-splenic pulp pressure of 27 cm of saline.

Since the endoscopic procedures were accomplished in close proximity in time to the x-ray studies, it is believed that the correlations which have been made in this study are valid.

SUMMARY

1. 200 patients with proved liver cirrhosis were investigated for the presence of complicating esophageal varices by the conventional radiologic method, (barium esophagram) and by endoscopy. The problems in diagnosis of esophageal varices which were encountered with each method are enumerated and the diagnostic yields are compared.

2. The endoscopic method proved to be superior for diagnosis, yielding positive results in 164 (82%) of the cases, while the x-ray method succeeded in demonstrating existing varices in only 78 (39%).

3. The endoscopic method permitted the detection of esophageal varices during an earlier stage of their development and generally showed them to involve a greater extent of the esophagus than did the x-ray method.

4. Emphasis is placed on the necessity for repeating the examinations and for checking one method against the other in cases where the diagnosis is doubtful or when the findings disagree.

TABLE I

X-ray

	Number	Percent
Varices Present	78	39.0
Varices Equivocal	31	15.5
Varices Negative	91	45.5
TOTAL	200	100.0

X-ray findings (Barium-Esophagram) in 200 Patients with Liver Cirrhosis

TABLE II

	Number	Percent	
Varices Present			
3+—4+	118	59.0)	
1+—2+	46	23.0)	82.0
Varices Equivocal	5	2.5	
Negative	31	15.5	
TOTAL	200	100.0	

Esophagoscopic Findings in the Same 200 Patients with Liver Cirrhosis

TABLE III

Comparison of X-ray and Esophagoscopy in the Diagnosis of Esophageal Varices in the Same 200 Patients with Liver Cirrhosis

Esophagoscopy	No. of Patients	X-ray		
		Pos.	Equiv.	Neg.
Positive				
3+—4+	118	69	22	27
1+—2+	46	5	5	36
Equivocal	5		2	3
Negative	31	4	2	25
TOTAL	200	78	31	91

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GASTROSCOPIC COLOR PHOTOGRAPHY WITH INCANDESCENT LIGHT

Beach Barrett, M.D.*

A development program was undertaken to provide equipment which would reliably take color photographs through the standard gastroscope with minimal inconvenience to the endoscopist and the patient.

Dr. Nelson's[1,2] system, consisting of a Leica camera with a prism-periscope viewing attachment and foot switch for boosting the viewing lamp voltage from 25 to 50 volts was studied and used as the basis for further development. It was felt that there were certain disadvantages to this system; namely, the inconvenient use of a foot switch and the large number of pictures blurred by motion when exposures of ½ to 1 second were used.

The following apparatus was designed and constructed: **Gastroscope:** The standard Eder gastroscope was modified as follows:

a) A 25 volt photographic bulb was used in place of the smaller 10 volt bulb. The larger bulbs and carriers are regularly available from the Eder Instrument Co. b) A marker "blip" was built into the gastroscope so that each photograph would be marked to indicate the direction of viewing. c) A ring to accept the camera was incorporated in the gastroscope eyepiece.

Camera: A Heiland Pentax H-2 single lens reflex camera body was selected because it incorporated an automatic quick-return mirror, a convenient quick-wind and film advance lever and an easily set shutter with speeds of 1/2, 1/4, 1/8, 1/15 and 1/30 second. The camera was modified as follows: a) A fixed-focus 50 mm. lens mount was made to fit the camera and also snap onto the modified gastroscope eyepiece. b) The delay for the synchronized shutter was set to the maximum value, providing 20 milliseconds between closing of the synchronizer contacts and opening of the shutter. Stroboscope tests indicate that the gastroscope bulb reaches full light output well within 20 milliseconds.

Control Box: A 110 V AC control box was constructed which would provide a wide range of voltages for viewing and for photography. This box contains a relay, operated by the camera shutter synchronizer contacts, which switches the gastroscope light from viewing voltage to photographing voltage 20 milliseconds before the shutter opens and returns it to viewing voltage as soon as the shutter closes. The control box is constructed so that the patient is safely isolated from the 110 volt line, and incorporates input and output fuses for further protection. A small transformer tapped in 5 to 10 volt increments from 2.4 to 110 volts was custom made for the control box.

Bulbs: The light output of an incandescent bulb increases greatly with voltage applied, probably somewhat more than the square of the voltage. If the 25 V bulb is flashed at 80 V, it will produce enough light for good exposure at 1/8 second in a bright stomach and 1/4 second in a dark one.

It was observed that when new 25 V bulbs are flashed even for 1/8 second at 80 volts, they will almost invariably burn out. How-

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ever, if they are flashed at progressively increased voltages, say 1/8 second at 40, 50, 60 and 70 volts, they are "seasoned" and will stand repeated flashing at 80 volts. They will blacken seriously after twenty or thirty exposures and must be replaced because of falling light output. If exposures of 1/4 second at 60 or 70 volts are used, the bulbs last much longer.

A larger bulb with double the light output of the 25 V bulb was made to order by Chicago Miniature Lamp Works, but it is difficult to introduce into the pharynx and hampers inspection of the lower stomach. A modification of the Eder-Bernstein gastroscope was made to mount two small 10 V bulbs, but this lengthened the rigid tip significantly. Good photographs can be obtained at 1/4 second using 30 or 40 volts.

Results

This equipment makes possible a fairly high proportion of acceptable color photographs using EH 135 high speed Ektachrome rated at ASA 160 daylight. The high voltage produces a color temperature which gives satisfactory color balance on daylight film. The images are only 6.5 mm in diameter, and with this somewhat grainy film, they can be projected only to small audiences. The photographs are quite satisfactory as a permanent record of gastroscopy findings, and for teaching small groups.

Operation of the equipment is easy for the endoscopist. The two selector switches of the control box are set for the desired viewing and photographing voltages. The camera and the gastroscope are connected to their respective leads and the camera placed within reach of the endoscopist. At the end of the gastroscopy, the camera is slipped onto the gastroscope eyepiece and the operator views the image through the camera finder. To take the photograph, he merely pushes the camera release button. The relay in the control box produces an audible "click," assuring the operator that all connections are in order. The image disappears only during the instant of exposure. One stroke of the camera lever prepares for the next photograph.

The cost of modifying the gastroscope and purchasing the camera and the parts for the control box was approximately $350.00.

It is anticipated that better photographs can be made in the future either by incorporating a small strobe light in the tip of the gastroscope, as is done in the OPL system[3], or by the use of an optical system which transmits more light.

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ABSTRACT

Debray, C. and Housset, P.
Presentation of a new biopsy gastroscope
Ann Otolaryng (Paris), 77: 162-6 March 1960

This paper was presented to the Societe de Broncho-Oesophagologie et de Gastroscopie de Langue Francaise in March 1959 and describes a new biopsy gastroscope designed by the authors and constructed by Optique et Precision de Levallois, France. An "aspiration-section" biopsy tube was mounted on a modified semi-flexible gastroscope, permitting an aspiration biopsy of gastric mucosa under direct and continuous observation.

The carrier tube moves longitudinally and independently, and is controlled proximally. An aspiration biopsy chamber with a distal biopsy aperture of 2.5 mm. is fitted to the end of the carrier tube. In the nonoperating position, the biopsy chamber lies flush to the gastroscope between the arms of a double-armed hinged lever. Advancing the carrier tube abducts the arms, elevating the biopsy capsule into the field of vision. A rotating knife inside the chamber is controlled proximally by a threaded wire passing through the carrier tube and secured by a pressure cone.

The authors emphasize that the biopsy head of this instrument is easily controlled, that the aspiration biospy is performed under direct visual control, and that orientation and control of the procedure are simple. Their preliminary results with 17 biopsies indicated that specimens were obtained without difficulty from precise locations.

Ivan C. Keever, M.D.

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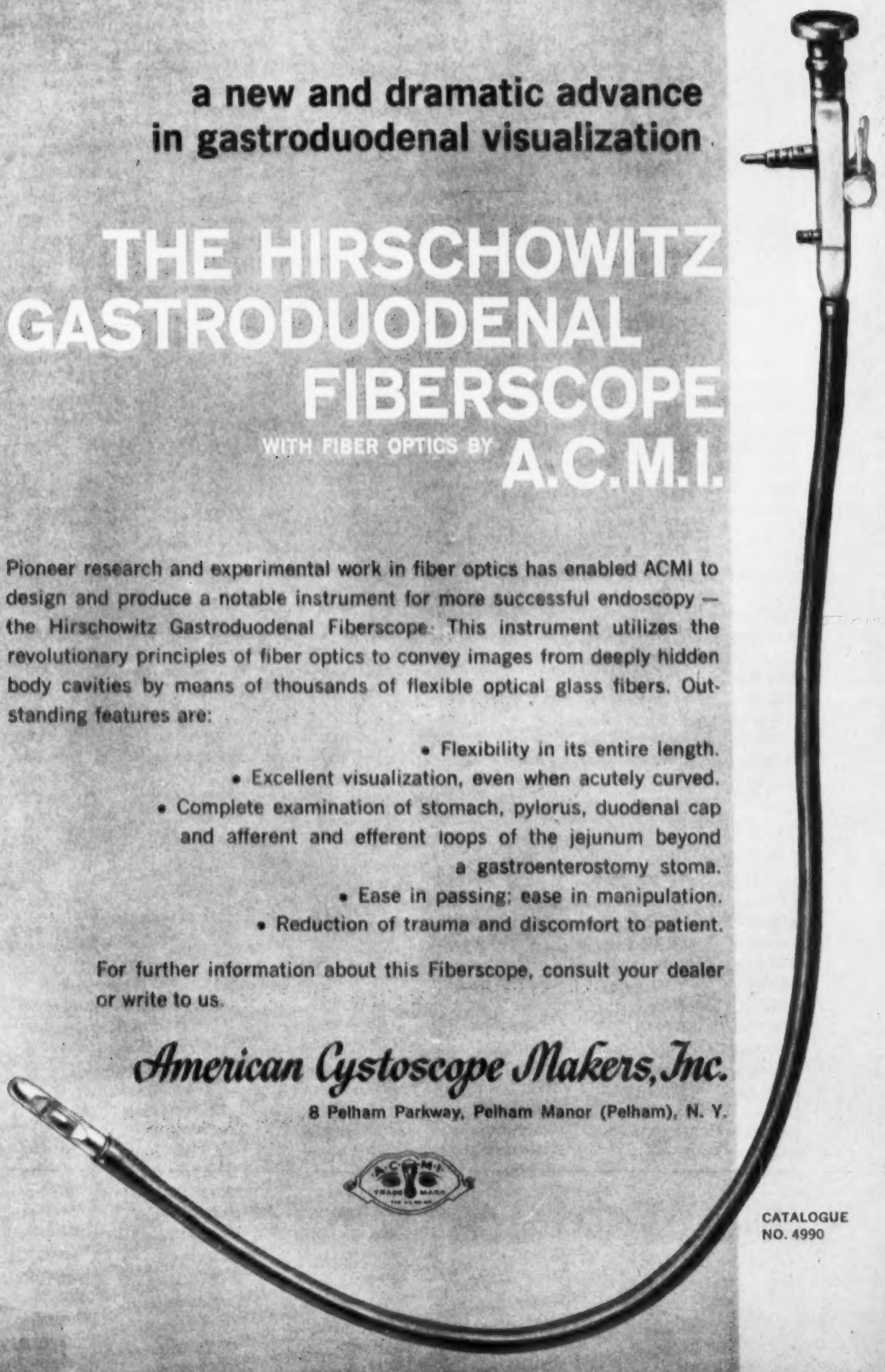

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LYMPHOSARCOMA OF THE STOMACH

Nathaniel Cohen, M.D.*

Lymphosarcoma of the stomach is the most common of all gastric sarcomas. In a recent review covering the period from 1934 to 1954, 85 cases of primary lymphosarcoma of the stomach were admitted to this hospital[1]. During the same period, there were 2,854 cases of gastric neoplasm. This represented an incidence of 3.4 per cent of all tumors of the stomach. It is of great importance to establish this diagnosis because gastric lymphosarcoma differs from carcinoma in its tendency to remain localized, to respond to radiation, and to have a better prognosis[2]. However, the propensity of the disease to recur after prolonged periods of apparent "cure" means that the ultimate prognosis must always be guarded.

It is generally agreed that the optimum treatment is surgical resection of the lesion followed by radiotherapy, but the lesions are usually extremely radiosensitive. Excellent and sometimes prolonged remissions can frequently be obtained by radiotherapy alone. Repeated radiotherapy is feasible and indicated for recurrences. In the occasional case with clear medical contraindications to major surgery, treatment with radiotherapy alone is warranted if the diagnosis can be definitely established by other means. Recent experience with such a case forms the basis of this report.

CASE REPORT

MSH No. 56431. A 75-year-old white male was admitted to The Mount Sinai Hospital for the fourth time in August 1958 with a three month history of marked anorexia; a 10 pound weight loss; pain in the thighs, low back, and shoulders; and severe angina pectoris. There was no fever or abdominal pain. His previous admissions had been in 1955 for resection of a carcinoma of the sigmoid colon and in 1956 and 1957 for acute myocardial infarctions. During his 1957 admission his stools became strongly guaiac-positive while on anticoagulants, but cleared when anticoagulants were discontinued. Barium enema demonstrated the site of the old anastomosis but was otherwise normal. An upper gastrointestinal series revealed multiple small filling defects in the stomach, but there was normal distensibility and peristalsis without evidence of ulceration, infiltration, or rigidity. The changes were interpreted as being due to large rugal folds. The small intestine was normal.

FIGURE 1
X-ray of the stomach before treatment demonstrating multiple small gastric filling defects.

On admission, his vital signs were normal. There was no lymphadenopathy. His heart was enlarged to the left and a grade 2 systolic murmur was heard at the apex. The liver was palpable 2 fingerbreadths below the right costal margin, but was smooth and non-tender. No other abdominal organs or masses were palpable. On rectal examination, the prostate was enlarged and there was a hard nodule in the right lobe.

Hemoglobin was 10.3 grams. The stools were repeatedly guaiac-negative. Urinalysis, white blood count, total protein, serum calcium, serum phosphorus, urea nitrogen, blood sugar, and bone-marrow aspiration were all normal. Erythrocyte sedimentation rate was 120 mm. per hour. There was 9.5%

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retention of BSP in 45 minutes. Alkaline and acid phosphatase, which had been normal in 1957 were now 60.0 and 9.3 King-Armstrong units respectively. Electrocardiograms revealed old myocardial infarctions. Gastric analysis showed no free acid.

X-ray studies of the bones demonstrated multiple areas of osteoblastic bony metastases in the pelvis, spine, ribs, femora, and humeri interpreted as prostatic in origin. A repeat gastrointestinal series showed the multiple small gastric filling defects to be slightly more prominent (Fig. 1), but there was otherwise no change from the 1957 examination. The interpretation was again large rugal folds, but the possibilities of multiple gastric polyps and of lymphosarcoma were raised. A suction biopsy of the gastric mucosa was reported as chronic atrophic gastritis. Gastric cytology with the abrasive gastric nylon brush of Nieburgs[3] revealed many malignant cells which were interpreted by the cytologist (Dr. H. E. Nieburgs) as indicative of lymphosarcoma (Fig. 2). His bone pain responded dramatically to diethylstilbesterol and he refused further diagnostic or therapeutic endeavors. He was therefore discharged from the hospital.

His anorexia became progressively worse

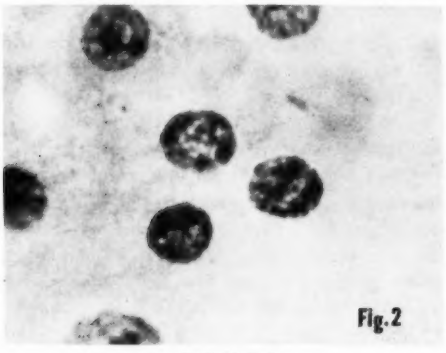

FIGURE 2
Gastric cytology before treatment. Group of lymphosarcoma cells (X 2000).

over the next two months and he returned for further diagnostic studies and therapy in November 1958. Physical examination and routine laboratory studies were essentially unchanged.

Gastroscopy was performed by the standard technique without difficulty. Scattered throughout the stomach were multiple submucosal sessile nodules, varying from 0.5

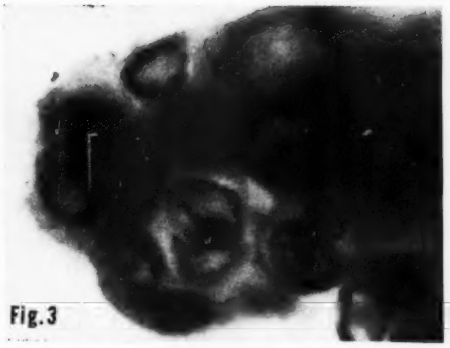

FIGURE 3
Gastric cytology one month after radiation therapy. Typical radiation changes but no tumor cells. (X 2000).

to 2 centimeters in diameter and with normal overlying mucosa. There was no ulceration of the nodules. In the fundus were several small superficial mucosal erosions with overlying greyish exudate. The rugal folds were not unusual and the distensibility of the stomach was normal. The gastroscopic impression was lymphosarcoma.

Gastric brush cytology again showed lymphosarcoma cells and an upper gastrointestinal series was unchanged. In view of his general medical condition it was decided to treat his gastric lymphosarcoma with radiation therapy. Beginning in December 1958 he was treated with radioactive cobalt via anterior and posterior fields to the stomach, receiving a tumor dose of 3450 r in 33 days.

Following completion of therapy, his appetite and strength improved strikingly. One month later his stomach x-rays were essentially unchanged but gastric brush cytology showed only radiation changes and disappearance of tumor cells (Fig. 3). In December 1959, eleven months following treatment, gastrointestinal series revealed a striking decrease in the gastric filling defects (Fig. 4). When last seen in February 1960, he was doing well. His appetite and strength were normal, his bone pain was well controlled with diethylstilbesterol, and his only complaint was occasional anginal pain responding to nitroglycerine.

DISCUSSION

Since there are no characteristic clinical or laboratory findings in lymphosarcoma of the stomach, special techniques must be employed if the diagnosis is to be established without surgery. Apart from gastrointestinal

x-rays, which are often helpful other techniques of value are gastroscopy, cytology, and biopsy.

Although it is generally agreed that it is impossible gastroscopically to differentiate the ulcerative and the localized polypoid forms from other gastric malignancies[4,5,6], many observers have described typical gastroscopic appearances in the infiltrative and the nodular forms[4,5,7]. Yarnis and Colp[4] state that the marked exaggeration of rugae with ridgelike elevation and polypoid formation, and the presence of nodular tumors of varying size, covered by relatively normal mucosa or with a minimal degree of ulceration are rather characteristic. According to Palmer[7], when there is marked infiltration the rugal folds appear enlarged and cannot be altered with inflation, but the submucosal position of the tumor is usually apparent. In the nodular form, the appearance is that of "submucosal polyposis." Fundamentally the mucosa over the tumor is normal in color and may be intact. However, erosions, ulcers, and hemorrhages over parts of the tumor, secondary to the underlying disease, may produce changes in the appearance of the mucosa. These gastroscopic appearances in the infiltrative and the nodular forms, although not absolutely diagnostic, are at least highly suggestive of the diagnosis of lymphosarcoma.

Cytologic criteria are now adequate for differentiating malignant lymphomas from carcinoma, but among the lymphomas only Hodgkin's disease can be separated from the various histologic types of lymphosarcoma by cytology[2]. Cells exfoliated from a lymphoma are distributed singly or occasionally in groups with the individual cells still maintaining their isolation from one another, in contrast to the crowded clumps with poorly demarcated cytoplasmic boundaries and overlapping nuclei characteristic of carcinoma. The lymphoma cells have lymphoid nuclei characterized by heavy nuclear membranes of smooth outline, closely packed chromatin aggregates, scant karyoplasm, and nucleoli that, if visible, are less prominent than those of carcinoma. forming a thin rim about the nucleus. And

FIGURE 4
X-ray of the stomach eleven months after radiation therapy. Marked decrease in the gastric filling defects.

cytoplasmic vacuolization is evidence against lymphoma, since it often indicates mucus production.

The lymphoid cytoplasm is usually sparse,

Gastric biopsy, with either the operating gastroscope or the Woods tube, can frequently establish the correct diagnosis definitely. However, lymphosarcoma of the stomach is believed to originate in the lymphoid germinal follicles of the submucosa and, at first, the process is limited to the submucosa. In addition, multiple areas of involvement can be separated by free intervals of normal tissue. Consequently, a negative biopsy does not rule out the diagnosis, since it may not have been deep enough or it may have been taken from an uninvolved area.

Although it is unlikely that a true cure was attained, the excellent response in this patient serves to emphasize the necessity of establishing the diagnosis of lymphosarcoma of the stomach, even in patients with contraindications to surgery, so that effective palliative treatment with radiotherapy can be instituted.

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ABSTRACTS

M. Lehtinen, A. Aho, K. Seppala, and W. J. Kaipainen

X-Ray and Gastroscopy Findings in Gastric Cancer

Ann. Med. Internae Fenniae 1960: 49: 27

This study is designed to evaluate the diagnostic accuracy of the radiologic and gastroscopic methods in a series of 91 proven cases of gastric carcinoma.

X-Ray was definitely positive in 29, suspicious in 41, and failed to diagnose carcinoma in 21 cases.

Gastroscopy was definitely positive in 20, suspicious in 29, and failed to diagnose carcinoma in 42 cases. In the latter group technical difficulties were responsibile for the diagnostic failure in 26; obstruction at the cardia being encountered in 16. In 12 instances non-malignant lesions were diagnosed while normal findings were encountered in 4.

Both methods agreed in 11 cases. X-ray was definitely positive in 7 where the gastroscopic findings were "suspicious." Gastroscopy was positive in 9 where the x-ray findings were "suspicious."

The mutually complementary nature of both diagnostic approaches is emphasized.

Angelo E. Dagradi, M.D.

Bernstein, L. M. Fruin, R. C. and Gorvett, E.
An esophagogastroscope for visualization of blind areas
Gastroenterology 37: 17, July 1959

With the ordinary gastroscope objective, a blind area is produced wherever the instrument contacts the mucosa. This is due to spacial separation of the light source and objective lens, which necessitates a small critical distance between instrument and object, if light is to be reflected into the lens system. To eliminate the blind areas of mucosal contact, the standard gastroscope head was reconstructed. A single objective chamber was designed so that the lamp could lie very close to the objective mirror, behind a single window. This move also shortened the length of the rigid head-piece. It required the addition of a focussing ocular because of the very short distances which now could be managed easily with the gastroscope.

(This modification is a great advance in gastroscopic construction. After more than two years of continuous use, early enthusiasm is sustained. Almost all improvements on gastroscopic design have demanded some sacrifice elsewhere on the instrument—increased diameter, loss of flexibility, etc. This improvement is all improvement.)

Eddy D. Palmer, M.D.

MALIGNANT MELANOMA METASTATIC TO THE STOMACH

Gastroscopic Observations

Joseph P. Belber, M.D.*

The occurrence of gastrointestinal symptoms in a patient with malignant melanoma suggests the possibility of metastases to the gastrointestinal tract. It is the purpose of this paper to describe such a case with particular reference to the gastroscopic findings, and correlation with radiograms.

CASE REPORT

O. M., a 74-year-old white male, was first hospitalized at Veterans Administration Hospital, Oakland, California on March 23, 1960, because of severe weakness and anemia. In January 1960 gross melena had developed and he had received four units of blood at another hospital. Dark stools had continued since that time, but they had been attributed to oral iron therapy.

In October 1957 a malignant melanoma had been removed from the right forearm. Metastases to the skin of the right knee and left cheek occurred within the next 18 months. In January 1960 a chest x-ray demonstrated multiple metastatic nodules. There was a history of myocardial infarction in 1950 and in 1959, with effort angina since 1950. This had become worse since January 1960, presumably because of continuing anemia.

Physical examination revealed a well-nourished, somewhat pallid white male with blood pressure of 130/80 and pulse of 80. A 6 cm. surgical scar on the right forearm showed no evidence of tumor recurrence. A 1 mm. blue-black nodule was present on the left cheek; a 2 cm. blue-black nodule was present on the medial aspect of the right knee; and a 1 mm. blue-black nodule was noted on the left tonsillar pillar. Liver and spleen were not palpable, nor was any significant adenopathy present. Hemoglobin was 8.7 gm. Red blood count was 2.65 million. A chest x-ray demonstrated several small round densities of varying size scattered throughout the lung fields (Fig. 1). An upper gastrointestinal series demonstrated two polypoid lesions, the proximal resembling a moderately large ulceration with a meniscus sign, and the distal lesion showed a central fleck (Fig. 2).

Initial gastroscopic examination was performed March 28, 1960, using a Cameron omniangle gastroscope. Just at the angulus, on the anterior wall toward the greater curvature, an almost spherical polyp slightly more than a centimeter in diameter was noted. On its upper surface a rather deep umbilication was noted which showed blue-black pigmentation (Fig. 3). It did not appear to be ulcerated. The antrum and pylorus were not abnormal. Projecting from the posterior wall in the upper midportion

FIGURE 1
Several nodular metastases are noted in the chest x-ray.

was a sessile polypoid neoplasm about 6 cm. in diameter and 3 cm. high. Its apex was replaced by a large deep central umbilication which contained a 2 cm. ulceration in its base. Because of the tangential view this could not be inspected in its entirety (Fig. 4). Subsequently these lesions were

*From the Department of Medicine, Veterans Administration Hospital, Oakland, California.

photographed with the Gastroflex of the Optique et Precision de Levallois of France. On May 11, 1960, a third examination disclosed no essential change in the two lesions previously described, but two additional lesions were seen. High on the posterior wall a slightly elevated pigmented plaque 0.5 by 1 cm. was noted, which was pigmented light brown and was neither umbilicated nor ulcerated. In the fundus another 1 cm. polypoid lesion with a central pigmented umbilication was seen which was almost identical in appearance and color with the lesion at the angulus. None of the four lesions visualized showed evidence of fresh bleeding.

The patient was treated with repeated blood transfusions and was maintained adequately with one to two units of blood weekly. Stools were periodically tarry. The advisability of resection to control bleeding was considered, but because of the multiplicity of lesions and the probability of still undemonstrated lesions in the small bowel, surgery was not performed.

DISCUSSION: Blood-borne metastasis to the stomach is rare, but when it does occur, malignant melanoma is not infrequently responsible. Willis[1] cites 53 cases of true metastatic tumors of the stomach, 17 percent of which were malignant melanomas. Davis and Zollinger[2] however, in reporting a case and reviewing 23,019 autopsies, found 67 instances of metastasis to the stomach, only 3 of which were melanoma. Metastases tend to be multiple with involvement of the small intestine occurring as well. Not infrequently other organs are involved, though under such circumstances the liver may actually be exempted[1]. According to Willis, most metastatic growths are situated initially in the submucosa forming circumscribed nodules or plaques. When these enlarge and invade the mucosa, crateriform ulceration almost invariably supervenes, especially in the stomach, presumably because of the acidity and proteolytic activity of the gastric juice.

Radiologically, metastatic melanoma usually appears as a polypoid filling defect[3,4]. This may show a central collection of barium giving a doughnut appearance[2,5]. It has been stated that the central depression is due to ulceration but the "doughnut" lesion seen in the distal stomach in Figure 2 showed a pigmented umbilication which was not ulcerated (Fig. 3). This also occurred in one other almost identical tumor nodule seen in the fundus at a subsequent examination. Furthermore, Case 2 of Calderon et al was visualized gastroscopically as a 5 cm. submucosal tumor with dimple formation in the center but was not ulcerated. It would therefore appear that the central collection of barium noted radiologically in these tumors is by no means a certain sign of ulceration, and in early lesions may only represent a characteristic umbilication.

FIGURE 2
Two polypoid tumor nodules showing central collections of barium are present.

FIGURE 3
1.2 cm. tumor nodule is noted at angulus. The central umbilication was blue-black in color.

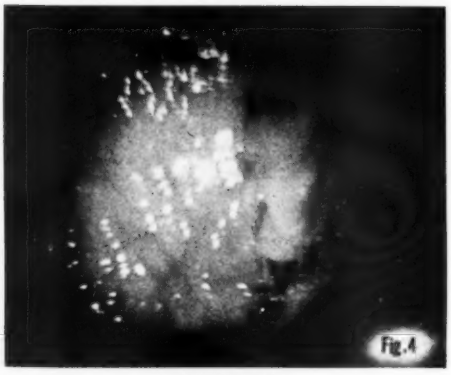

FIGURE 4
Tangential view of proximal tumor mass with central ulceration. The distal nodule may be seen bottom right just below the muscular sphincter of the antrum.

Ulceration may eventually supervene at that point. The proximal lesion in Figure 2 was obviously ulcerated when seen gastroscopically though Figure 4 fails to demonstrate this because of the tangential view in that portion of the stomach. Not all metastatic lesions are so prominently polypoid. The fourth tumor metastasis visualized in this patient was relatively flat and plaque-like, but was obviously melanoma with its brown pigmentation.

Clinically, melanoma metastasizing to the gastrointestinal tract may make itself apparent either by hemorrhage or by symptoms of intestinal obstruction[6]. Palliative resection may be considered and has been carried out to control persistent bleeding[5].

SUMMARY: A case of malignant melanoma with multiple gastric metastases is presented. Variation in gastroscopic appearance of the lesions is described and correlated with x-ray findings.

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ABSTRACT

Smith, H. W.
Esophagoscopy during active Gastrointestinal hemorrhage
Conn. Med. 23(8): 519, Aug. 1959

Approximately seventy-five patients with upper gastro-intestinal tract hemorrhage were satisfactorily examined at the time of bleeding without having to abandon the procedure and without mishap.

Emphasis is placed on the need for securing the patient on the operating table; on the use of a cuff-type endotracheal tube; on adequate topical anesthesia (1% pontocaine) supplemented, if needed, by intravenous meperidine or a volatile anesthetic gas; on the necessity for emptying the stomach beforehand of accumulated blood; on the use of suction and foreign body forceps to remove fresh blood and clots; and the occasional flushing with ice water to diminish acute bleeding.

A 45 cm. esophagoscope was passed over a flexible bougie if resistance was encountered at the cricopharynx. It was often necessary to pass the esophagoscope back and forth through the cardiac sphincter and to position the patient in various degrees of Trendlenberg to locate the exact source of bleeding.

The details of the findings are to be reported in another paper. The purpose of this article is to emphasize the feasibility and safety of emergency esophagoscopy by the techniques employed at the Grace-New Haven Community Hospital.

Julius Wolf, M.D.

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